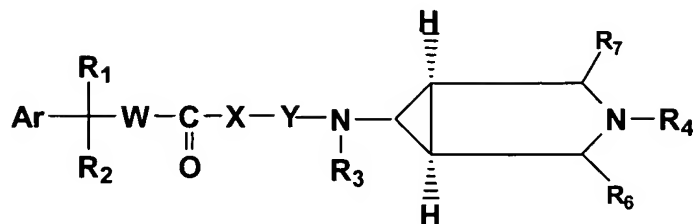


1 1. (Original) Compounds having the structure of Formula I:



5 **Formula I**

6 and their pharmaceutically acceptable salts, pharmaceutically acceptable solvates,
7 esters, enantiomers, diastereomers, N-oxides, polymorphs, prodrugs, or metabolites,
8 wherein

9 Ar represents an aryl or a heteroaryl ring having 1-2 hetero atoms selected from the group
10 consisting of oxygen, sulphur and nitrogen atoms, the aryl or heteroaryl rings may be
11 unsubstituted or substituted by one to three substituents independently selected from lower
12 alkyl (C₁-C₄), lower perhaloalkyl (C₁-C₄), cyano, hydroxy, nitro, halogen (e.g. F, Cl, Br,
13 I), lower alkoxy (C₁-C₄), lower perhalo-alkoxy (C₁-C₄), unsubstituted amino, N-lower
14 alkylamino (C₁-C₄) or N-lower alkylamino carbonyl (C₁-C₄);

15 R₁ represents a hydrogen, hydroxy, hydroxymethyl, amino, alkoxy, carbamoyl or halogen
16 (e.g. fluorine, chlorine, bromine and iodine);

17 R₂ represents alkyl, C₃-C₇ cycloalkyl ring in which any 1-4 hydrogen atoms are
18 substituted with halogen (e.g. F, Cl, Br, I), carbamoyl or lower alkyl;

19 W represents (CH₂)_p, where p represents 0 to 1;

20 X represents an oxygen, sulphur, NR or no atom wherein R represents
21 hydrogen or C₁-C₆ alkyl;

22 Y represents CHR₅CO wherein R₅ represents hydrogen, methyl or (CH₂)_q
23 wherein q represents 0 to 4;

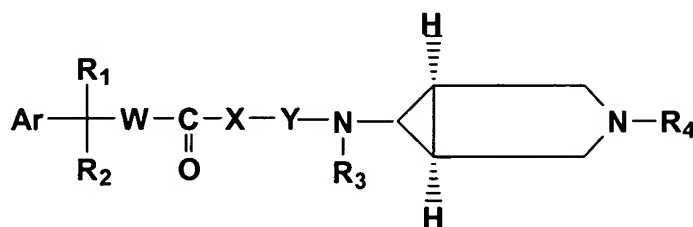
24 R₃ represents hydrogen, lower alkyl or CO₂C(CH₃)₃;

25 R_6 and R_7 are independently selected from H, lower alkyl, COOH, CONH₂, NH₂,
 26 CH₂NH₂; and

27 R_4 represents C₁-C₁₅ saturated or unsaturated aliphatic hydrocarbon (straight chain or
 28 branched) in which any 1 to 6 hydrogen atoms may be substituted with the group
 29 independently selected from halogen, arylalkyl, arylalkenyl, heteroarylalkyl or
 30 heteroarylalkenyl having 1 to 2 hetero atoms selected from the group consisting of
 31 nitrogen, oxygen and sulphur atoms with an option that any 1 to 3 hydrogen atoms on an
 32 aryl or heteroaryl ring in said arylalkyl, arylalkenyl, heteroarylalkenyl group may be
 33 substituted with lower alkyl (C₁-C₄), lower perhalo alkyl (C₁-C₄), cyano, hydroxy, nitro,
 34 lower alkoxy, carbonyl, halogen, lower alkoxy (C₁-C₄), lower perhaloalkoxy (C₁-C₄),
 35 unsubstituted amino, N-lower alkylamino (C₁-C₄), or N-lower alkylamino carbonyl (C₁-
 36 C₄).

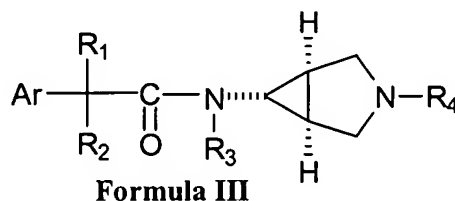
1 2. (Original) A compound according to claim 1 having the structure of Formula
 2 II and its pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters,
 3 enantiomers, diastereomers, N-oxides, polymorphs, prodrugs, metabolites, wherein

4 Ar, R_1 , R_2 , W, X, Y, R_3 and R_4 are as defined for formula I.



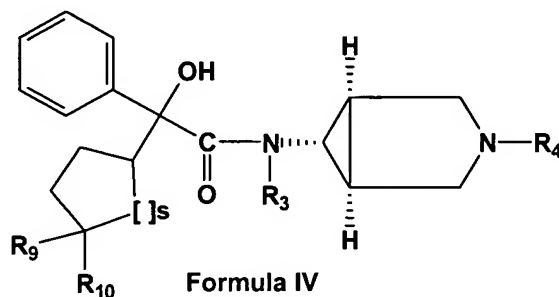
8 **Formula II**

1 3. (Original) A compound according to claim 1 having the structure of Formula
 2 III and its pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters,
 3 enantiomers, diastereomers, N-oxides, polymorphs, prodrugs, metabolites, wherein Ar, R_1 ,
 4 R_2 , R_3 and R_4 are as defined for Formula I.



7 **Formula III**

- 1 4. (Original) A compound according to claim 1 having the structure of Formula
 2 IV and its pharmaceutically acceptable salts, esters, enantiomers, diastereomers, N-oxides,
 3 prodrugs, or metabolites wherein R_3 and R_4 are as defined for Formula I, and s represents
 4 1 to 2, R_9 is H or F and R_{10} is F.

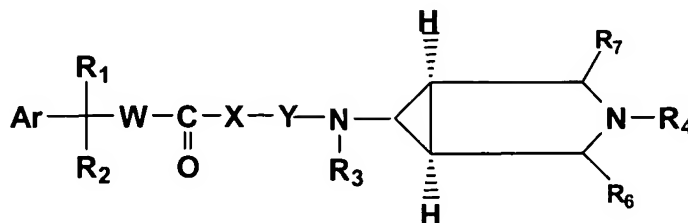


- 5
- 1 5. (Original) A compound selected from the group consisting of
- 2 (2S)-(1 α , 5 α , 6 α)-6-N-[3-benzyl-3-azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S)-3-
- 3 oxocyclohexyl]-2-hydroxy-2-phenylacetamide
- 4 (2S)-(1 α , 5 α , 6 α)-6-N-[3-benzyl-3-azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S, 3R or
- 5 3S)-3-(fluorocyclohexyl)-2-hydroxy-2-phenylacetamide
- 6 (2S)-(1 α , 5 α , 6 α)-6-N-[3-benzyl-3-azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S, 3R or
- 7 3S)-3-fluorocyclopentyl]-2-hydroxy-2-phenylacetamide
- 8 (2S)-(1 α , 5 α , 6 α)-6-N-[3-benzyl-3-azabicyclo[3.1.0]-hexyl]-2-2[(1R or 1S)-3, 3-
- 9 difluorocyclohexyl]-2-hydroxy-2-phenylacetamide
- 10 (2S)-(1 α , 5 α , 6 α)-6-N-[3-benzyl-3-azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S)-3,3-
- 11 difluorocyclopentyl]-2-hydroxy-2-phenylacetamide
- 12 (2R)-(1 α , 5 α , 6 α)-6-N-[3-benzyl-3-azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S)-3,3-
- 13 difluorocyclopentyl]-2-hydroxy-2-phenylacetamide
- 14 (2S)-(1 α , 5 α , 6 α)-6-N-[3-(2-(3,4-methylenedioxyphenyl)ethyl)-3-
- 15 azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S)-3, 3-difluorocyclohexyl]-2-hydroxy-2-
- 16 phenylacetamide

- 17 (2S)-(1 α , 5 α , 6 α)-6-N-[3-(2-(3, 4-methylenedioxyphenyl)ethyl)-3-
 18 azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S)-3, 3-difluorocyclopentyl]-2-hydroxy-2-
 19 phenylacetamide
- 20 (2R)-(1 α , 5 α , 6 α)-6-N-[3-(2-(3,4-methylenedioxyphenyl)ethyl)-3-
 21 azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S)-3, 3-difluorocyclopentyl]-2-hydroxy-2-
 22 phenylacetamide
- 23 (2S)-(1 α , 5 α , 6 α)-6-N-[3-(2-(3, 4-methylenedioxyphenyl)ethyl)-3-
 24 azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S, 3R or 3S)-3-fluorocyclohexyl]-2-hydroxy-
 25 2-phenylacetamide
- 26 (2S)-(1 α , 5 α , 6 α)-6-N-[3-(2-(3, 4-methylenedioxyphenyl)ethyl)-3-
 27 azabicyclo[3.1.0]-hexyl]-2-[(1R or 1S, 3R or 3S)-3-fluorocyclopentyl]-2-hydroxy-
 28 2-phenylacetamide
- 29 (2S)-(1 α , 5 α , 6 α)-6-N-[3-(4-methyl-3-pentenyl)-3-azabicyclo[3.1.0]-hexyl]-2-[(1R
 30 or 1S)-3, 3-difluorocyclohexyl]-2-hydroxy-2-phenylacetamide
- 31 (2S)-(1 α , 5 α , 6 α)-6-N-[3-(4-methyl-3-pentenyl)-3-azabicyclo[3.1.0]-hexyl]-2-[(1R
 32 or 1S)-3, 3-difluorocyclopentyl]-2-hydroxy-2-phenylacetamide
- 33 (2R)-(1 α , 5 α , 6 α)-6-N-[3-(4-methyl-3-pentenyl)-3-azabicyclo[3.1.0]-hexyl]-2-
 34 [(1R or 1S)-3, 3-difluorocyclopentyl]-2-hydroxy-2-phenylacetamide
- 35 (2S)-(1 α , 5 α , 6 α)-6-N-[3-(4-methyl-3-pentenyl)-3-azabicyclo[3.1.0]-hexyl]-2-[(1R
 36 or 1S, 3R or 3S)-3-fluorocyclohexyl]-2-hydroxy-2-phenylacetamide
- 37 (2S)-(1 α , 5 α , 6 α)-6-N-[3-(4-methyl-3-pentenyl)-3-azabicyclo[3.1.0]-hexyl]-2-[(1R
 38 or 1S, 3R or 3S)-3-fluorocyclopentyl]-2-hydroxy-2-phenylacetamide.

- 1 6. (Original) A pharmaceutical composition comprising a therapeutically
 2 effective amount of a compound as defined in any of claims 1-5 together with
 3 pharmaceutically acceptable carriers, excipients or diluents.

7. (Original) A method for treatment or prophylaxis of an animal or a human suffering from a disease or disorder of the respiratory, urinary and gastrointestinal systems, wherein the disease or disorder is mediated through muscarinic receptors, comprising administering to said animal or human, a therapeutically effective amount of a compound having the structure of Formula I,



Formula I

and its pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters, enantiomers, diastereomers, N-oxides, polymorphs, prodrugs, metabolites, wherein

Ar represents an aryl or a heteroaryl ring having 1-2 hetero atoms selected from the group consisting of oxygen, sulphur and nitrogen atoms, the aryl or heteroaryl rings may be unsubstituted or substituted by one to three substituents independently selected from lower alkyl (C₁-C₄), lower perhaloalkyl (C₁-C₄), cyano, hydroxy, nitro, halogen (e.g. F, Cl, Br, I), lower alkoxy (C₁-C₄), lower perhalo-alkoxy (C₁-C₄), unsubstituted amino, N-lower alkylamino (C₁-C₄) or N-lower alkylamino carbonyl (C₁-C₄);

R₁ represents a hydrogen, hydroxy, hydroxymethyl, amino, alkoxy, carbamoyl or halogen (e.g. fluorine, chlorine, bromine and iodine);

R₂ represents alkyl, C₃-C₇ cycloalkyl ring in which any 1-4 hydrogen atoms are substituted with halogen (e.g. F, Cl, Br, I), carbamoyl or lower alkyl;

W represents (CH₂)_p, where p represents 0 to 1;

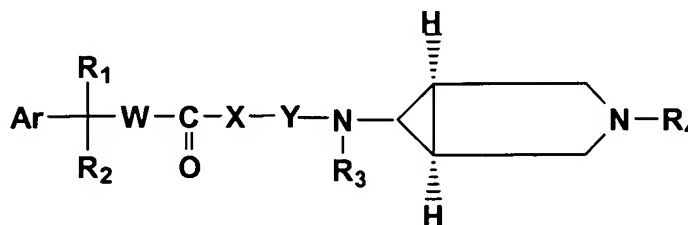
X represents an oxygen, sulphur, NR or no atom wherein R represents hydrogen or C₁-C₆ alkyl;

Y represents CHR₅CO wherein R₅ represents hydrogen, methyl or (CH₂)_q wherein q represents 0 to 4;

27 R_3 represents hydrogen, lower alkyl or $\text{CO}_2\text{C}(\text{CH}_3)_3$;
 28 R_6 and R_7 are independently selected from H, lower alkyl, COOH , CONH_2 , NH_2 ,
 29 CH_2NH_2 ; and

30 R_4 represents $\text{C}_1\text{-C}_{15}$ saturated or unsaturated aliphatic hydrocarbon (straight chain or
 31 branched) in which any 1 to 6 hydrogen atoms may be substituted with the group
 32 independently selected from halogen, arylalkyl, arylalkenyl, heteroarylalkyl or
 33 heteroarylalkenyl having 1 to 2 hetero atoms selected from the group consisting of
 34 nitrogen, oxygen and sulphur atoms with an option that any 1 to 3 hydrogen atoms on an
 35 aryl or heteroaryl ring in said arylalkyl, arylalkenyl, heteroarylalkenyl group may be
 36 substituted with lower alkyl ($\text{C}_1\text{-C}_4$), lower perhalo alkyl ($\text{C}_1\text{-C}_4$), cyano, hydroxy, nitro,
 37 lower alkoxy, carbonyl, halogen, lower alkoxy ($\text{C}_1\text{-C}_4$), lower perhaloalkoxy ($\text{C}_1\text{-C}_4$),
 38 unsubstituted amino, N-lower alkylamino ($\text{C}_1\text{-C}_4$), N-lower alkylamino carbonyl ($\text{C}_1\text{-C}_4$).

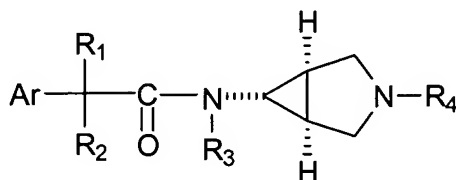
1 8. (Original) The method according to claim 7 for treatment or prophylaxis of an
 2 animal or a human suffering from a disease or disorder of the respiratory, urinary and
 3 gastrointestinal systems, wherein the disease or disorder is mediated through muscarinic
 4 receptors, comprising administering to said animal or human, a therapeutically effective
 5 amount of a compound having the structure of Formula II and its pharmaceutically
 6 acceptable salts, pharmaceutically acceptable solvates, esters enantiomers, diastereomers,
 7 N-oxides, polymorphs, prodrugs or metabolites, wherein Ar, R_1 , R_2 , W, X, Y, R_3 and R_4
 8 are as defined for Formula I.



12 **Formula II**

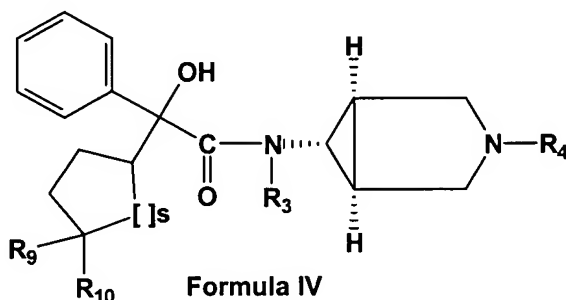
1 9. (Original) The method according to claim 7 for treatment or prophylaxis of an
 2 animal or a human suffering from a disease or disorder of the respiratory, urinary and
 3 gastrointestinal systems, wherein the disease or disorder is mediated through muscarinic
 4 receptors, comprising administering to said animal or human, a therapeutically effective
 5 amount of a compound having the structure of Formula III and its pharmaceutically

acceptable salts, pharmaceutically acceptable solvates, esters, enantiomers, diastereomers, N-oxides, polymorphs, prodrugs or metabolites, wherein Ar, R₁, R₂, R₃ and R₄ are as defined for Formula I.



Formula - III

10. (Original) The method according to claim 7 for treatment or prophylaxis of an animal or a human suffering from a disease or disorder of the respiratory, urinary and gastrointestinal systems, wherein the disease or disorder is mediated through muscarinic receptors, comprising administering to said animal or human, a therapeutically effective amount of a compound having the structure of Formula-IV and its pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters, enantiomers, diastereomers, N-oxides, polymorphs, prodrugs or metabolites, wherein R₃ and R₄ are as defined for Formula I, s represents 1 to 2, R₉=H or F, and R₁₀=F.



Formula IV

11. (Original) The method according to claim 7 wherein the disease or disorder is urinary incontinence, lower urinary tract symptoms (LUTS), bronchial asthma, chronic obstructive pulmonary disorders (COPD), pulmonary fibrosis, irritable bowel syndrome, obesity, diabetes and gastrointestinal hyperkinesis.

12. (Original) The method according to claim 8 wherein the disease or disorder is urinary incontinence, lower urinary tract symptoms (LUTS), bronchial asthma, chronic obstructive pulmonary disorders (COPD), pulmonary fibrosis, irritable bowel syndrome, obesity, diabetes and gastrointestinal hyperkinesis.

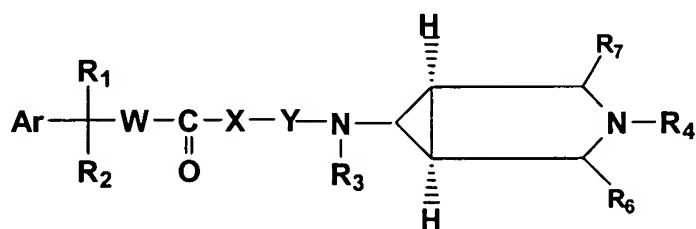
1 13. (Original) The method of claim 9 wherein the disease or disorder is urinary
 2 incontinence, lower urinary tract symptoms (LUTS), bronchial asthma, chronic obstructive
 3 pulmonary disorders (COPD), pulmonary fibrosis, irritable bowel syndrome, obesity,
 4 diabetes and gastrointestina hyperkinesis.

1 14. (Original) The method of claim 10 wherein the disease or disorder is urinary
 2 incontinence, lower urinary tract symptoms (LUTS), bronchial asthma, chronic obstructive
 3 pulmonary disorders (COPD), pulmonary fibrosis, irritable bowel syndrome, obesity,
 4 diabetes and gastrointestina hyperkinesis.

1 15. (Original) The method for treatment or prophylaxis of an animal or a human
 2 suffering from a disease or disorder of the respiratory, urinary and gastrointestinal
 3 systems, wherein the disease or disorder is mediated through muscarinic receptors,
 4 comprising administering to said animal or human, a therapeutically effective amount of
 5 the pharmaceutical composition according to claim 6.

1 16. (Original) The method according to claim 15 wherein the disease of disorder is
 2 urinary incontinence, lower urinary tract symptoms (LUTS), bronchial asthma, chronic
 3 obstructive pulmonary disorders (COPD), pulmonary fibrosis, irritable bowel syndrome,
 4 obesity, diabetes and gastrointestina hyperkinesis.

1 17. (Original) A process of preparing compounds of Formula I,



Formula I

6 and their pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters,
 7 enantiomers, diastereomers, N-oxides, polymorphs, prodrugs or metabolites, wherein
 8 Ar represents an aryl or a heteroaryl ring having 1-2 hetero atoms selected from the group
 9 consisting of oxygen, sulphur and nitrogen atoms, the aryl or heteroaryl rings may be
 10 unsubstituted or substituted by one to three substituents independently selected from lower

11 alkyl (C₁-C₄), lower perhaloalkyl (C₁-C₄), cyano, hydroxy, nitro, halogen (e.g. F, Cl, Br,
 12 I), lower alkoxy (C₁-C₄), lower perhalo- alkoxy (C₁-C₄), unsubstituted amino, N-lower
 13 alkylamino (C₁-C₄) or N-lower alkylamino carbonyl (C₁-C₄);

14 R₁ represents a hydrogen, hydroxy, hydroxymethyl, amino, alkoxy, carbamoyl or
 15 halogen (e.g. fluorine, chlorine, bromine and iodine);

16 R₂ represents alkyl, C₃-C₇ cycloalkyl ring in which any 1-4 hydrogen atoms are
 17 substituted with halogen (e.g. F, Cl, Br, I), carbamoyl or lower alkyl;

18 W represents (CH₂)_p, where p represents 0 to 1;

19 X represents an oxygen, sulphur, NR or no atom wherein R represents
 20 hydrogen or C₁-C₆ alkyl;

21 Y represents CHR₅CO wherein R₅ represents hydrogen, methyl or (CH₂)_q
 22 wherein q represents 0 to 4;

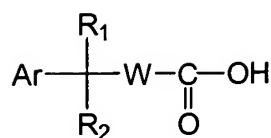
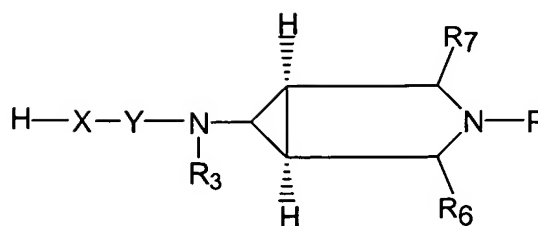
23 R₃ represents hydrogen, lower alkyl or CO₂C(CH₃)₃;

24 R₆ and R₇ are independently selected from H, lower alkyl, COOH, CONH₂, NH₂,
 25 CH₂NH₂; and

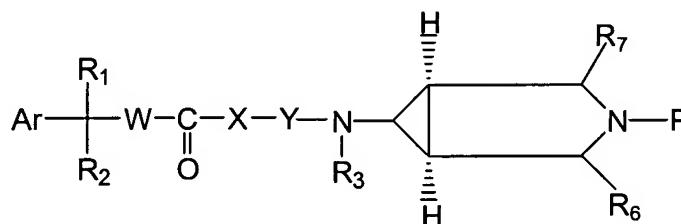
26 R₄ represents C₁-C₁₅ saturated or unsaturated aliphatic hydrocarbon (straight chain or
 27 branched) in which any 1 to 6 hydrogen atoms may be substituted with the group
 28 independently selected from halogen, arylalkyl, arylalkenyl, heteroarylalkyl or
 29 heteroarylalkenyl having 1 to 2 hetero atoms selected from the group consisting of
 30 nitrogen, oxygen and sulphur atoms with an option that any 1 to 3 hydrogen atoms on an
 31 aryl or heteroaryl ring in said arylalkyl, arylalkenyl, heteroarylalkenyl group may be
 32 substituted with lower alkyl (C₁-C₄), lower perhalo alkyl (C₁-C₄), cyano, hydroxy, nitro,
 33 lower alkoxy carbonyl, halogen, lower alkoxy (C₁-C₄), lower perhaloalkoxy (C₁-C₄),
 34 unsubstituted amino, N-lower alkylamino (C₁-C₄), N-lower alkylamino carbonyl (C₁-C₄),
 35 comprising

36 (a) condensing a compound of Formula VI with a compound of Formula V

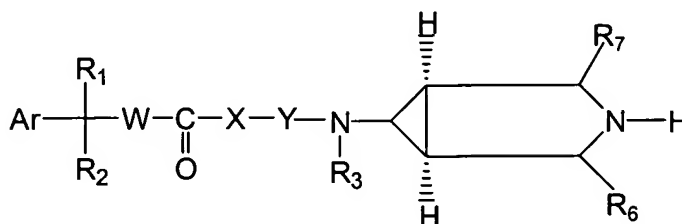
37

**Formula VI****Formula V**

wherein Ar, R₁, R₂, W, X, Y, R₃, R₆ and R₇ are as defined earlier for Formula I, to give a protected compound of Formula VII wherein Ar, R₁, R₂, W, X, Y, R₃, R₆ and R₇ are as defined earlier and P is a protecting group for an amino group,

**Formula VII**

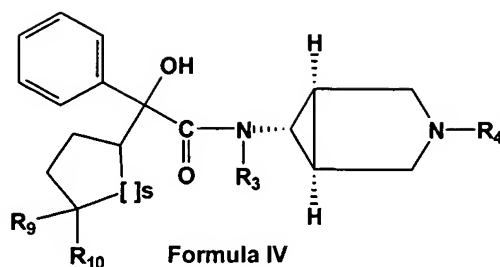
(b) deprotecting the compound of Formula VII in the presence of a deprotecting agent to give an unprotected compound of Formula VIII wherein Ar, R₁, R₂, R₃, W, X, Y, R₆ and R₇ are as defined earlier, and

**Formula VIII**

(c) N-alkylated or benzylated the compound of Formula VIII with a suitable alkylating or benzylating agent to give compounds of Formula I wherein Ar, R₁, R₂, W, X, Y, R₃, R₄, R₆ and R₇ are as defined earlier.

1 18. – 26. (Cancelled).

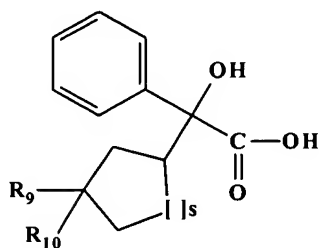
1 27. (Original) A process of preparing compounds of Formula IV,



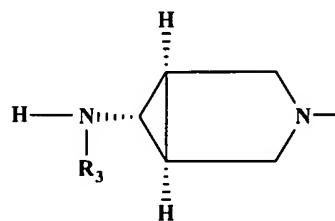
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3 and their pharmaceutically acceptable salts, pharmaceutically acceptable solvates, esters,
 4 enantiomers, diastereomers, N-oxides, polymorphs, prodrugs, or metabolites, wherein R_3
 5 represents hydrogen, lower alkyl or $\text{CO}_2\text{C}(\text{CH}_3)_3$; R_4 represents C_1 - C_{15} saturated or
 6 unsaturated aliphatic hydrocarbon (straight chain or branched) in which any 1 to 6
 7 hydrogen atoms may be substituted with the group independently selected from halogen,
 8 arylalkyl, arylalkenyl, heteroarylalkyl or heteroarylalkenyl having 1 to 2 hetero atoms
 9 selected from the group consisting of nitrogen, oxygen and sulphur atoms with an option
 10 that any 1 to 3 hydrogen atoms on an aryl or heteroaryl ring in said arylalkyl, arylalkenyl,
 11 heteroarylalkenyl group may be substituted with lower alkyl (C_1 - C_4), lower perhalo alkyl
 12 (C_1 - C_4), cyano, hydroxy, nitro, lower alkoxy, carbonyl, halogen, lower alkoxy (C_1 - C_4),
 13 lower perhaloalkoxy (C_1 - C_4), unsubstituted amino, N-lower alkylamino (C_1 - C_4), N-lower
 14 alkylamino carbonyl (C_1 - C_4); s represents 1 to 2, R_9 is H or F and R_{10} is F, comprising

15 (a) condensing a compound of Formula IX with a compound of Formula X

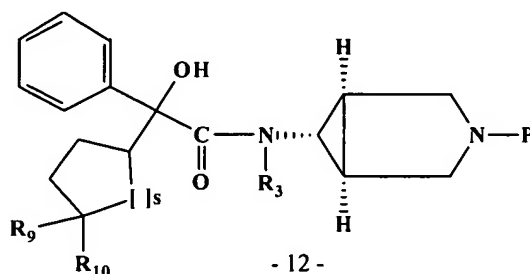


Formula IX



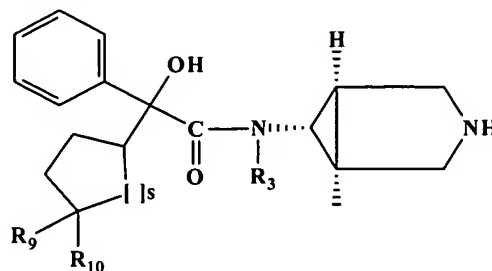
Formula X

20 wherein R_3 and R_4 are as defined earlier for Formula I, s represents 1 to 2, R_9 is H
 21 or F and R_{10} is F, to give a protected compound of Formula XI wherein R_3 , R_4 , s,
 22 R_9 and R_{10} are as defined earlier and P is a protecting group for an amino group,



Formula XI

- (b) deprotecting the compound of Formula XI in the presence of a deprotecting agent to give an unprotected compound of Formula XII wherein R_3 , R_4 , s , R_9 and R_{10} are as defined earlier, and



Formula XII

- (c) N-alkylated or benzylated the compound of Formula XII with a suitable alkylating or benzylating agent to give compounds of Formula IV wherein R_3 , R_4 , s , R_9 and R_{10} are as defined earlier.

1 28. – 36. (Cancelled).